

# INTRODUCTION TO ECOLOGY

CHAPTER 18

# Section 1 - Objectives

- Identify a key theme in ecology.
- Describe an example showing the effects of interdependence upon organisms in their environment.
- Identify the importance of models to ecology.
- State the five different levels of organization at which ecology can be studied.

# Section 1 - Vocabulary

- Ecology
- Interdependence
- Ecological Model
- Biosphere
- Ecosystem
- Community
- Population

# Ecology

- Definition of Ecology
  - The study of the interactions between organisms and the living and nonliving components of their environment.
- Ecology is a broad science that involves collecting information about organisms and their environments, observing and measuring interactions, looking for patterns, and seeking to explain these patterns.

# Interdependence: A Key Theme in Ecology

- All organisms interact with other organisms in their surroundings and with the nonliving portion of their environment.
- Their survival depends on these interactions.
- Ecologists refer to this quality as interdependence.
- Definition of Interdependence
  - The dependence of every organism on its connections with other living and nonliving parts of its environment.

# What is an example of Interdependence?

- Humans can not survive without the plants and other photosynthetic organisms that produce oxygen.
- Conversely, photosynthetic organisms depend on the release of carbon dioxide gas by the cellular respiration of other organisms, such as humans.

# Effects of Interdependence

- Can you think of an example of interdependence in which the effects of one organism can affect another organism?



# Effects of Interdependence



# Ecological Models

- Definition of Ecological Models
  - A model that represents or describes the relationships between the components of an ecological system.
- Ecologists construct models to help them understand environmental interactions and to make predictions about possible changes.

# Levels of Organization

- Biosphere
  - The part of Earth where life exists, and it includes all of the living organisms on Earth.
  - Extends from about 6 miles above Earth's surface to the deepest parts of the oceans.

# Levels of Organization

- Ecosystems
  - The biosphere is composed of smaller units called ecosystems.
  - An ecosystem includes all of the organisms and the nonliving environment found in a particular place.
  - Example: Pond
    - Includes fish, turtles, aquatic plants, algae, insects, bacteria, the chemical composition of the pond (pH level, oxygen level, and CO<sub>2</sub> level), and amount of sunlight

# Levels of Organization

- Communities
  - A community includes all the interacting organisms living in an area.
  - Example: fish, turtles, plants, algae, and bacteria
  - May include thousands of organisms

# Levels of Organization

- Populations
  - A population includes all the members of a species that live in one place at a given time.
  - Example: the population of turtles in the pond

# Levels of Organization

- Organisms
  - The simplest level of organization in ecology is that of the organism.